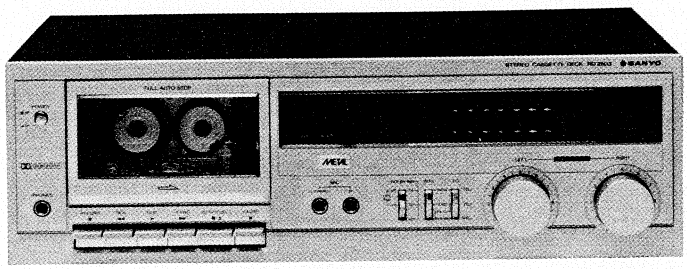
SERVICE MANUAL

SANYO

CASSETTE TAPE DECK

RD2016
RD2503
(EUROPE)



RD2016

RD2503

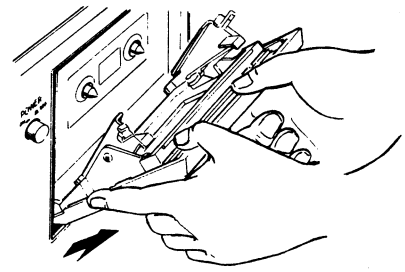
SPECIFICATIONS

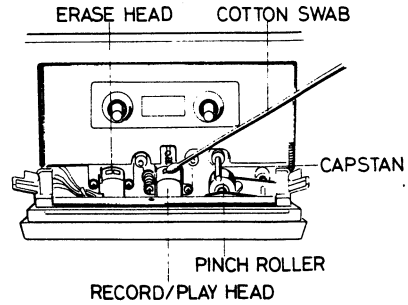
Tape	Metal, CrO_2, FeCr, Low noise and Standard tape
Recording system	AC bias, 4-track stereo
Erasing system	AC erasing, 2-track
Tape speed	4.75 cm/sec. (1-7/8 i.p.s.)
Recording time	60 min. (C–60)
Rewind and fast forward time	100 sec. (C–60)
Wow and flutter	0.06% WRMS
Frequency response	30 – 18,000Hz (metal) 30 – 16,000Hz (CrO_2) 30 – 16,000Hz (Fe-Cr) 30 – 13,000Hz (normal)
Signal to noise ratio	64dB (Dolby NR on, CrO_2 tape) 56dB (Dolby NR off, CrO_2 tape)
Input	MIC: 400 ohms to 10 kohms (0.5mV) DIN (REC/PLAY): 0.1mV/kohm LINE IN: 50 kohms (50mV)
Output	DIN (REC/PLAY): 3 kohms (0.53V) LINE OUT: 3 kohms (0.53V) PHONES: 8 ohms to 10 kohms
Power source	AC: 220V, 50Hz
Power consumption	10W
Dimensions (Approx.)	440(W) x 270(D) x 132(H) mm (17-3/8" x 10-5/8" x 5-3/16")
Weight (Approx.)	4.3kg (9 lbs. 7 ozs.)

* Specifications subject to change without notice.

To assure continued high performance form you cassette deck, periodically clean the heads and pinch roller whenever dust or reddish-brown oxide has accumulated. Failure to clean these parts will result in inferior sound quality distortions of recording, deteriorations of high frequency reproduction and inconsistent tape speed.

1. Open the cassette compartment lid by pushing the STOP/EJECT button.
2. Remove the cassette compartment lid (part of window).
3. Moisten a cotton applicator with head cleaner and apply to the faces of both heads, rubbing gently until all traces of dirt or oxide are removed. Also clean the surfaces of the pinch roller and the capstan.
4. Dry, clean, and polish the faces of the heads with a piece of dry cloth.





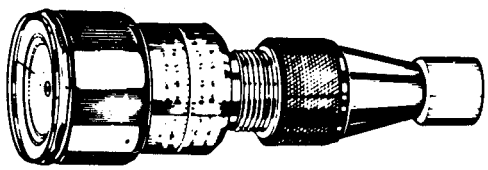
MECHANISM ADJUSTMENTS

1. TAKE-UP TORQUE

Set the unit to PLAY, F.FWD or REW mode.
Measure each torque with a torque gauge.
Each torque should be as follows;

PLAY	35 – 60 g/cm
FAST FORWARD	70 – 130 g/cm
REWIND	70 – 130 g/cm

If each torque fails to reach the standard value, clean the drive belt, flywheel, motor pulley, take-up reel idler and rewind roller with a cotton swab soaked in alcohol.



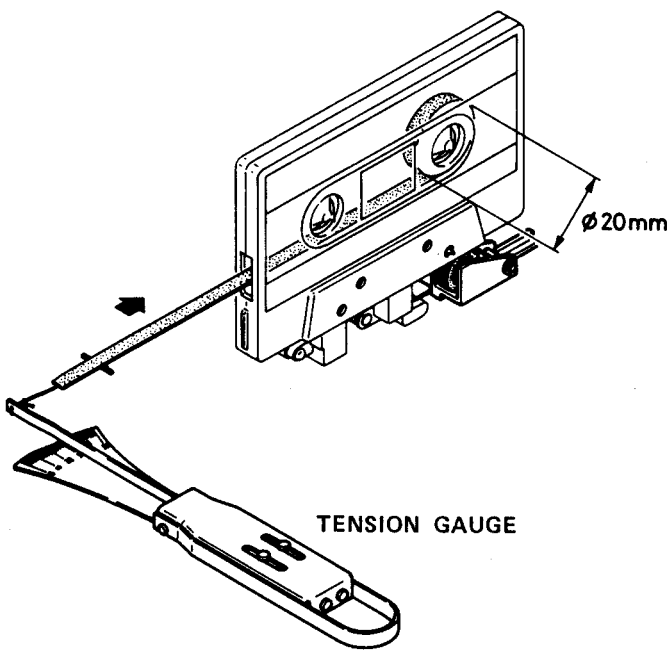
TORQUE GAUGE

TORQUE GAUGE

2. BACK TENSION

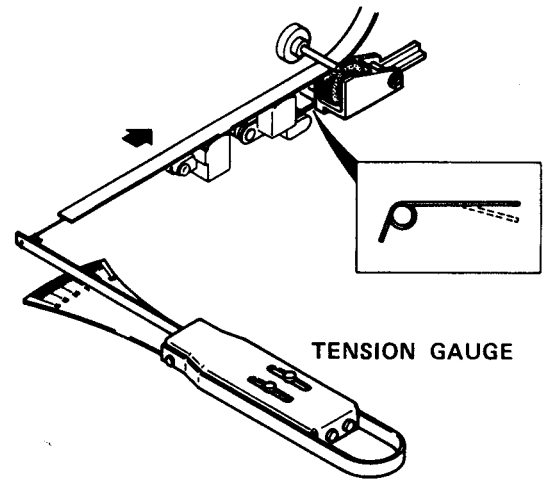
To measure back tension with tension gauge, make a hole in the side of the cassette as shown in figure two. Be sure the tape does not rub against the edge of the cassette, or correct measurement will be impossible.

PLAY	Less than 5 g/cm
FAST FORWARD	Less than 5 g/cm
REWIND	Less than 5 g/cm



3. TAPE TENSION

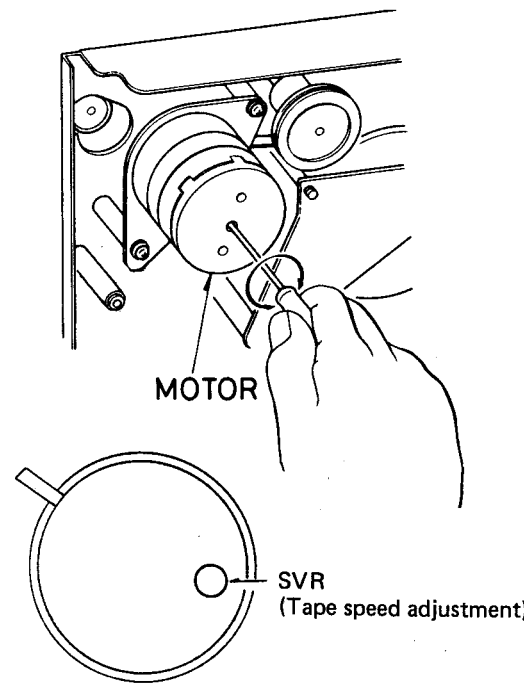
Cut off a length of tape. Tie one end to a thread connected to the tension gauge, and leave the other end hanging loose as shown in figure three.
Operate the unit in PLAY mode and hold the tension gauge steady.
When the tape stops, read the tension gauge. If this reading is over 120 gram, no adjustment is needed.
If it is under 120 gram, adjust the pinch-roller pressure This is done by bending the spring wire 32 (141-2-852T-47400) shown in the mechanism exploded view. Clean the pinch roller with alcohol so the tape will not slip.



TENSION GAUGE

4. Tape speed

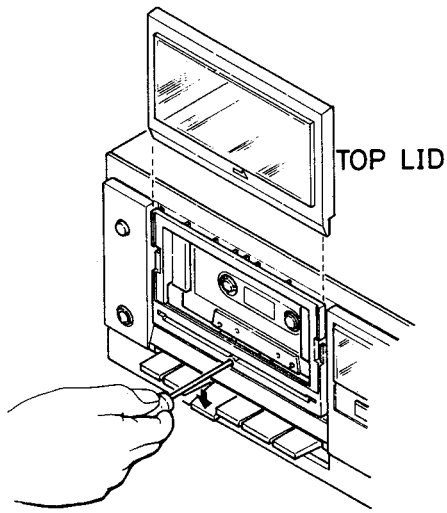
a. Remove the cabinet (see page 1).
b. Connect a counter to playback output terminals. Load with test tape (MTT-111, etc.). Press down PLAY lever.
c. Using a screwdriver (with about 2 mm wide blade), turn semivariable resistor for adjusting motor speed until the counter reads 3 kHz ± 10 Hz.



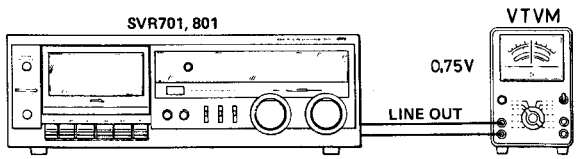
MOTOR

AMPLIFIER ADJUSTMENTS

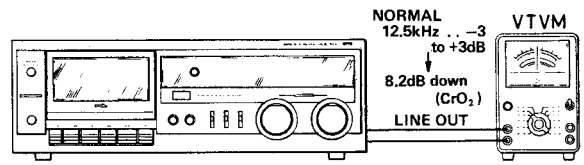
1. HEAD AZIMUTH
   Tape select switches: NORMAL
   Dolby switch: OFF
   Tape to be used: Test tape (10 kHz)
   Load a test tape and depress the PLAY button. Adjust the head azimuth screw so that the LINE OUT level becomes maximum. Repeat the adjustment on both channels and both sides of the tape.



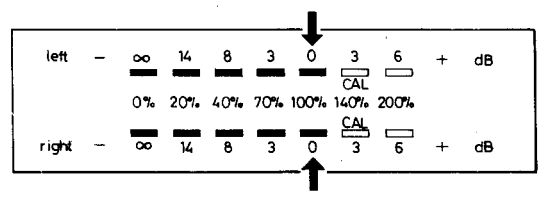
2. PLAYBACK OUTPUT
   Tape select switches: NORMAL
   Dolby switch: OFF
   Tape to be used: MTT-150 (Dolby tape)
   Load a test tape and depress the PLAY button. Adjust SVR701 and SVR801 so that the LINE OUT level becomes 0.75V.



3. PLAYBACK FREQUENCY CHARACTERISTICS
   Tape select switches: NORMAL → CrO_2
   Dolby switch: OFF
   Tape to be used: Test tape (1 kHz, 12.5 kHz/−20 dB)
   Put in the test tape, set the TAPE SELECT switches in the NORMAL position, and depress the PLAY button. Confirm that 12.5 kHz output is within −3 ~ +3 dB range as 1 kHz output is taken to be 0 dB. (confirmation on playback frequency characteristics under the NORMAL setting of the TAPE SELECT switches)
   When the TAPE SELECT switches are set in the CrO_2 position, confirm that 12.5 kHz output drops by 8.2 dB as that of the NORMAL setting taken to be 0 dB. (confirmation on playback frequency characteristics under the CrO_2 setting of the TAPE SELECT switches)
   NOTE: In the case where the aforementioned values are not satisfied, perform adjustment of head angle of the foregoing para. 1 and other again.



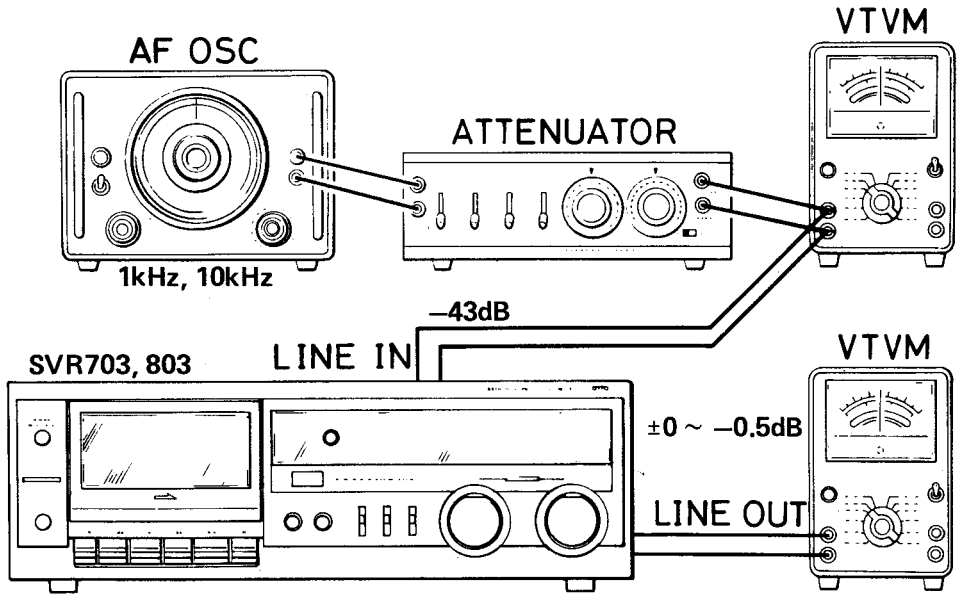
4. VU INDICATOR
   Tape select switches: NORMAL
   Dolby switch: OFF
   Feed input signal −23 dB (1 kHz) into the recording input terminal, and bring the set in the recording state. Turn the INPUT LEVEL control knobs, and confirm that 0 dB LED of the VU INDICATOR lights up when monitor output is 0.53V.
   If it does not light up, adjust with the following procedure:
   * In the case of lighting with monitor output of less than 0.53V −1 dB, cut off the DOWN indicated resistor (R751, 851).
   * In the case of lighting with monitor output of more than 0.53V +1 dB, cut off the UP indicated resistor (R753, 853).
   NOTE: Refer to the PARTS LOCATIONS diagram on Page 5 for position of resistors.



5. REC/PLAY FREQUENCY CHARACTERISTICS

Tape select switches: NORMAL
Dolby switch: OFF
Tape to be used: Blank tape (NORMAL)

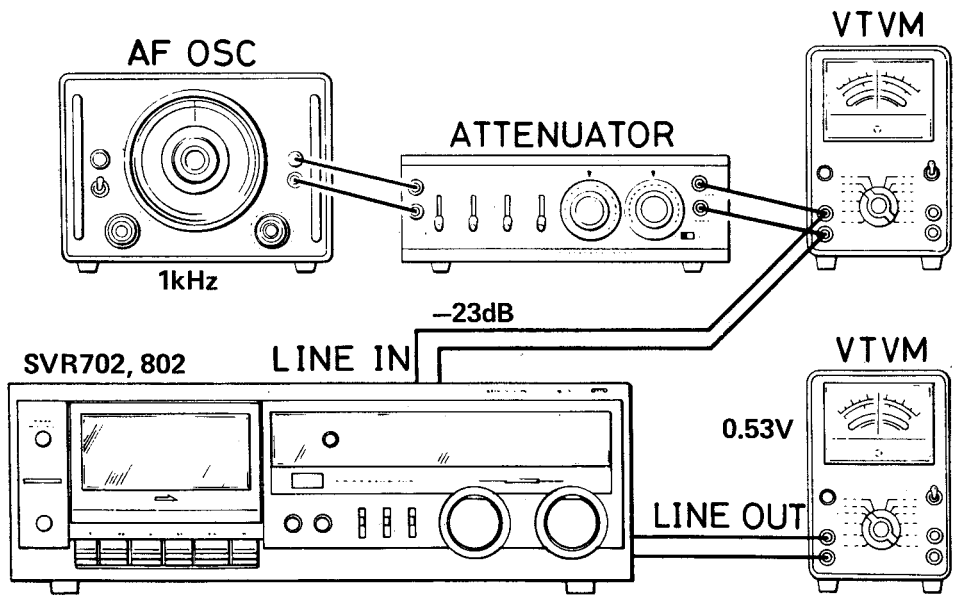
Put in a blank tape (NORMAL), set INPUT LEVEL control knobs in the same position as set in the foregoing para. 4 and the TAPE SELECT switches in the NORMAL position. Feed input signal –43 dB (1 kHz, 10 kHz) into the recording input terminal, and start recording. Play this recorded signal back. Taking the output of 1 kHz as 0 dB, adjust SVR703 and SVR803 until the output of 10 kHz becomes ±0 to –0.5 dB.



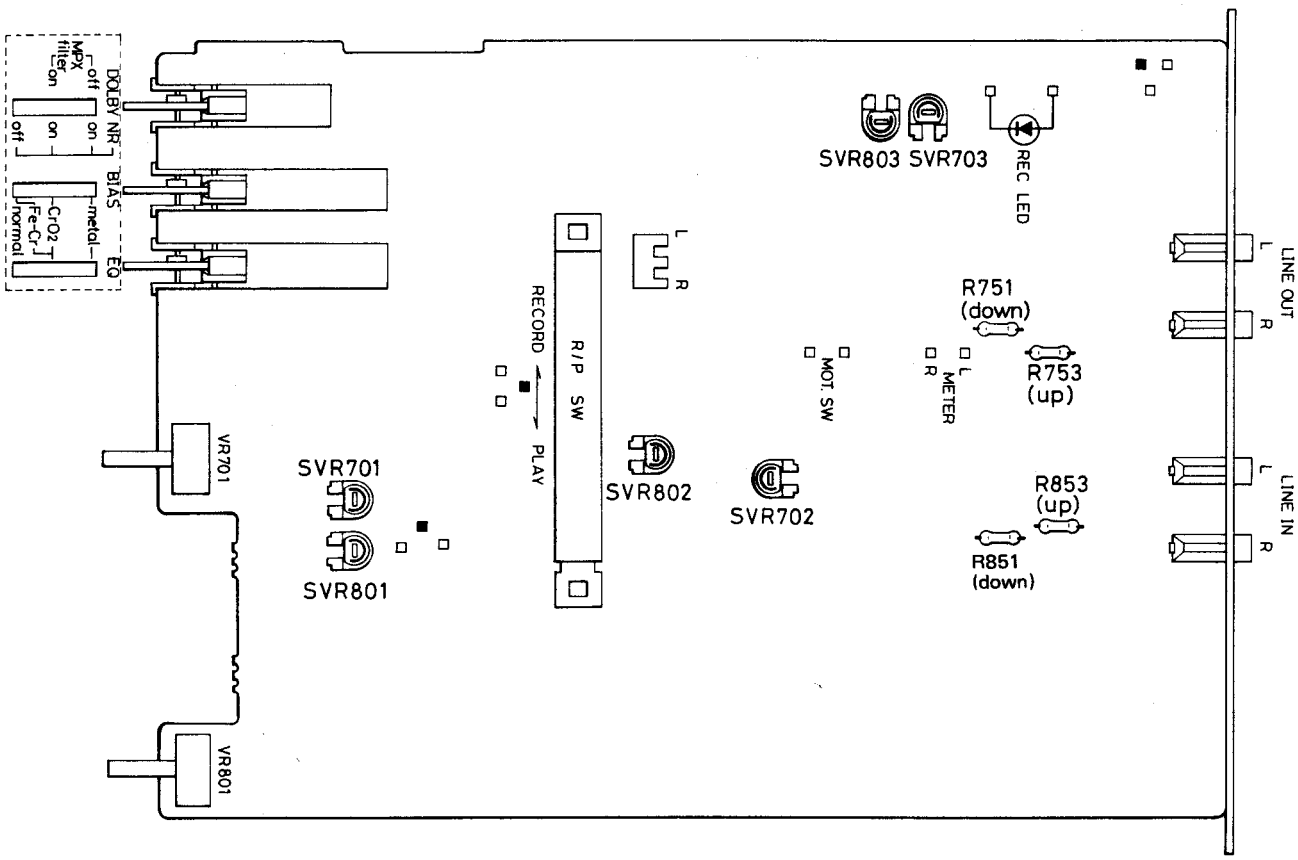
6. RECORD GAIN

Tape select switches: METAL
Dolby switch: OFF
Tape to be used: Blank Tape (METAL).

Put in a blank tape (METAL).
Set INPUT LEVEL control knobs to the same position as item 4 to obtain 0.53V of monitor output and the input signal level at –23 dB (1 kHz).
Record 1 kHz signal and play it back.
Adjust SVR702 and SVR802 so the playback output also becomes 0.53V.



PARTS LOCATIONS



AMPLIFIER ADJUSTMENTS

Items of adjustments	Tapes to be used	Points of measurement	Input terminal	Frequency	Input level	Tape select switches	Dolby switch	Places of adjustments	Value
Head azimuth	Test tape	LINE OUT		10kHz		NORMAL	OFF	Re-adjustment of head azimuth	Max
Playback output	MTT-150 (Dolby tape)	LINE OUT				NORMAL	OFF	SVR701 SVR801	0.75V
Playback frequency characteristics	Test tape (−20dB)	LINE OUT		1kHz 12.5kHz		NORMAL ↓ CrO_2	OFF		−3 ~ +3dB (NORMAL) ↓ 8.2dB down (CrO_2)
VU Indicator	Blank tape	LINE OUT VU Indicator	LINE IN	1kHz	−23dB	NORMAL	OFF	R751, 851 R753, 853	0.53V ±1dB 0dB LED
REC/PLAY Frequency characteristics	Blank tape (NORMAL)	LINE OUT	LINE IN	1kHz 10kHz	−43dB	NORMAL	OFF	SVR703 SVR803	±0dB to −0.5dB (as 1kHz output is 0dB)
Record gain	Blank tape (METAL)	LINE OUT	LINE IN	1kHz	−23dB	METAL	OFF	SVR702 SVR802	0.53V

ABOUT METAL TAPE

Where as normal, chrome, ferrochrome and other sound recording tapes are surface-coated with magnetic powder of iron oxide, metal tape has the surfaces covered with an unoxidized alloy whose main ingredient is pure iron.
Since base film is almost the same in all kinds of tape, the metal tape does not differ significantly from the others in regard to the physical and mechanical properties.
It, however, excels in terms of electrical characteristics because of its special surface coating.
For this reason, it can provide the tape-deck enthusiasts with greater satisfaction, enabling them to achieve superior high fidelity in the recording and playback of music.

ITEM / TAPE	Normal tape	Chrome tape	Ferrochrome tape	Metal tape
Coercive force Hc (oersted)	330	500	330	1,050
Density of residual magnetic flux Br (gauss)	1,200	1,500	1,500	3,200
Molecular construction	γFe_2O_3	CrO_2	$\gamma Fe_2O_3+CrO_2$	Fe

TABLE 1: Magnetic characteristics of cassette tapes

Characteristics of metal tape are shown in TABLE 1 and Fig. 1. From these, one can learn that it excels in coercive force and density of residual magnetic flux. Because of these outstanding characteristics, it has the following performance features when used on the cassette tape deck.

1. Excellent frequency responses at high input levels both in the recording and playback modes. (Fig. 2)
2. High maximum output levels over the entire frequency range. (Fig. 3)
3. A wide dynamic range at high frequency levels.
4. A superior SN ratio at high frequency levels.
5. An excellent distortion factor at high input levels. (Fig. 4)

* *When recording sound on metal tape, be sure to clean the heads thoroughly in advance. This is necessary to obtain maximum satisfaction from metal tape which features excellent performance characteristics at high frequency levels.*
It is also recommended that you read and follow the instructions contained in the manual on metal tape.

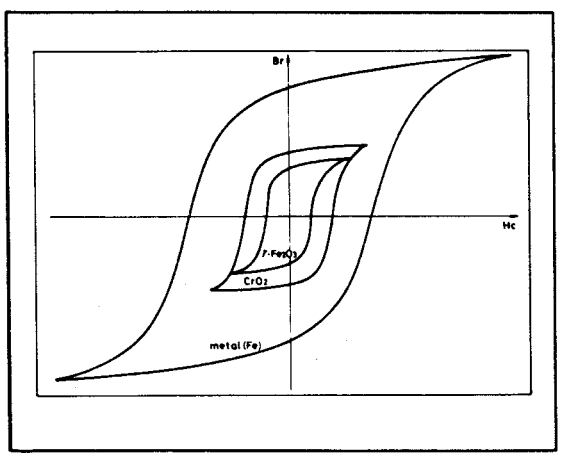


Fig. 1 Hysteresis loop

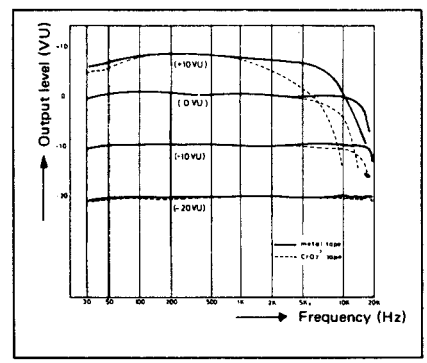


Fig. 2 Recording & playback frequency responses

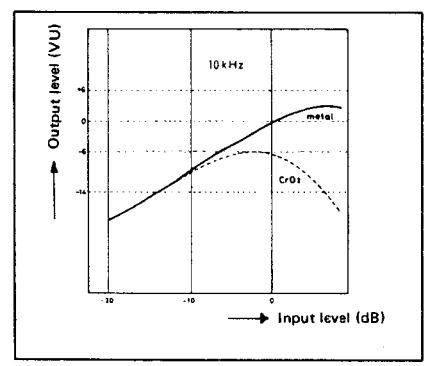


Fig. 3 Input & output characteristics

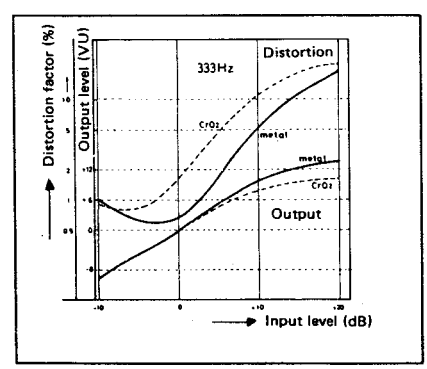
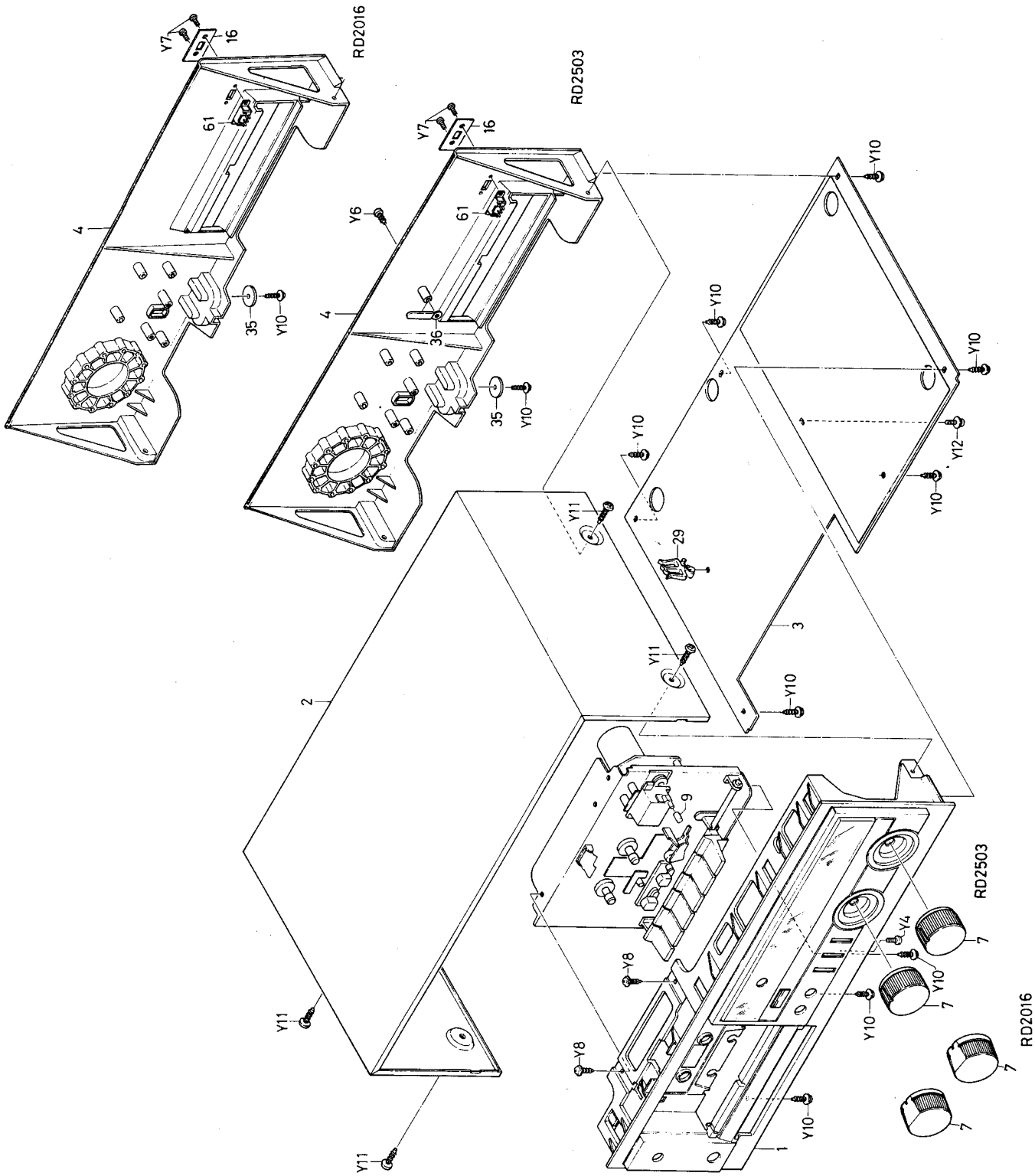


Fig. 4 Input & output distortion characteristics

EXPLODED VIEW (CABINET)



PARTS LIST

Ref. No.	Part No.	Description	Q'ty
PACKAGE			
	141-6-133T-18202	Individual Carton (RD 2016)	1
	141-6-133T-18200	Individual Carton (RD 2503)	1
	141-6-144T-66400	Foam Plastic Case	1
	141-6-144T-66401	Foam Plastic Case	1
	141-6-231T-10300	Inner Polye Cover, AC Cord	1
	141-6-231T-10200	Inner Polye Cover, Accessory	1
	141-6-231T-50700	Inner Polye Cover, Set	1
	141-6-331T-07800	Protector Sheet	1
	141-6-479T-31400	Label, AC	1
ACCESSARY			
	141-6-410T-52902	Instruction Manual (RD 2016)	1
	141-6-410T-52900	Instruction Manual (RD 2503)	1
	4-243T-13303	Lead Cord RCA-RCA	1
CABINET			
1	141-0-122T-36701	Front Panel Ass'y (RD 2016)	1
	141-0-122T-36700	Front Panel Ass'y (RD 2503)	1
2	141-2-111T-45830	Carbinet (RD 2016)	1
	141-2-111T-45800	Cabinet (RD 2503)	1
3	141-2-125T-22000	Bottom Lid	1
4	141-0-126T-34602	Back Lid Ass'y (RD 2016)	1
	141-0-126T-34600	Back Lid Ass'y (RD 2503)	1
5	141-0-124T-21307	Top Lid Ass'y (RD 2016)	1
	141-0-124T-21306	Top Lid Ass'y (RD 2503)	1
6	141-2-224T-10200	Bracket, Lid	1
7	141-0-163T-74200	Rotary Knob Ass'y, Volume (RD 2016)	2
	141-0-163T-74100	Rotary Knob Ass'y, Volume (RD 2503)	2
8	141-2-162T-17600	Lever Knob	3
9	141-2-156T-25300	Knob, Counter	1
10	141-2-210T-06800	Bracket, Holder	1
11	141-2-210T-06900	Bracket, Holder	1
12	141-2-855T-29700	Spring Coil, Bracket	2
13	141-0-581T-07100	Gear Ass'y	1
14	141-2-310T-25600	Bracket, Gear	1
15	141-2-855T-37900	Spring Coil, Top Lid	1
16	141-6-479T-48001	Label, Beat Cancel	1
17	141-2-855T-71500	Spring Coil	1
CHASSIS			
21	141-2-361T-17500	Bracket, AMP	1
22	141-2-365T-51700	Bracket, Power Switch	1
23	141-2-214T-05730	Bracket, LED (RD 2016)	1
	141-2-214T-05700	Bracket, LED (RD 2503)	1
24	141-2-855T-66300	Spring Coil, Rec	1
25	141-2-365T-42500	Bracket, PCB	1
26	141-2-161T-84600	Push Button, Power Switch (RD 2016)	1
	141-2-161T-62700	Push Button, Power Switch (RD 2503)	1
27	141-2-143T-80600	Marking Plate	1
28	141-2-310T-38300	Bracket, Mic	1
29	141-2-464T-36000	Fixer	1
30	141-2-464T-33700	Fixer	1
31	141-2-453T-01200	Washer 3x8x1, AMSS PCB	2
32	141-2-453T-01700	Washer 3x10x1, Bracket (23)	3
34	141-2-464T-20671	Fixer	8
35	123-2-453R-10500	Plastic Washer, 17ϕ, Power Cord	1
36	141-2-472T-01201	Lug, Lead (RD 2503 only)	1
SCREWS & OTHERS			
Y1		Pan Head Screw 2.6x4mm	2
Y2		Pan Head Screw with Spring Washer 2.6x6mm	2
Y3		Pan Head Screw 3x6mm	9
Y4		Pan Head Screw 3x8mm	1
Y5		Tapping Screw 2.6x8mm	2
Y6		Tapping Screw 3x8mm	2
Y7		Pan Head Screw, 2x11mm	2
Y8		Washer Head Tapping Screw 3x8mm	10
Y9		Washer Head Tapping Screw 3x10mm	4
Y10		Washer Head Tapping Screw 3x12mm	12
Y11		Binding Head Tapping Screw 4x10mm	4
Y12		Pan Head Screw with Spring Washer 3x8mm	1
Y13		Hexagon Nut 7mmϕ	2
Y14		Binding Head Tapping Screw 3x6mm	1
ELECTRICAL PARTS			
57	4-300T-22601	Power Transformer	1
58	4-238T-12873	Switch, Power	1
59	4-243T-83200	Power Cord	1
60	4-235T-44871	Socket, Phono	1
	123-2-472R-00401	Lug	1
MAIN PCB ASS'Y			
51	141-4-233T-46603	P.C Board Ass'y, Main	1
S1	4-238T-22200	Switch, R/P	1
S2,3	4-238T-14800	Switch, Bias, EQ	2
S4	4-238T-14900	Switch, Dolby/MPX	1
S9	4-231T-42100	Switch, Mic/Line	1
(61) S10	4-231R-14500	Switch, Beat Cancel	1
VR701, 801	4-222T-83890	Variable Resistor	2
SVR701, 801, 702, 802	4-222T-81475	Semifixed Variable Resistor 10K	4
SVR703, 803	4-222T-81477	Semifixed Variable Resistor 50K	2
	4-235T-55472	Socket, Line in/Line Out/DIN	1
L501,551	4-255T-01671	MX Coil	2
L703,803	4-255T-01971	MX Coil	2
L601	4-258T-28000	OSC Coil	1
	4-236T-10200	Plug, R/P Head	1
	4-235T-76400	Socket, E Head	2
L702,802	4-253T-01006	Hi-frequency Choke	2
L701,801	4-253T-04500	Hi-frequency Choke	2
IC701		IC LA3160T	1
IC501, 551		IC LM1011N	2
Q701,801, 705,805		Transistor 2SC536 AUD	4
Q704,804, 601,602, 702,802		Transistor 2SC945 AUD	6
Q901		Transistor 2SD400	1
Q703,803		Transistor 2SD545	2
Q902,903		Transistor 2SA608	2
D906		Diode DS442X	1
D905		Zener Diode GZA20U	1
	RESISTORS		
R902		Solid 8.2 ohm ±10% 1/2W	1
R722,822		Solid 330 ohm ±10% 1/2W	2
R601		Solid 680 ohm ±10% 1/2W	1
R602		Solid 1K ohm ±10% 1/2W	1
R603		Solid 120 ohm ±10% 1/2W	1
R919		Metal 150 ohm ±10% 1W	1
R705,805		Carbon 8.2K ohm ±5% 1/4W	2
R703		Carbon 68 ohm ±5% 1/4W	1
R803		Carbon 68 ohm ±5% 1/4W	1
R704		Carbon 5.6K ohm ±5% 1/4W	1
R706		Carbon 3.3K ohm ±5% 1/4W	2
R804		Carbon 5.6K ohm ±5% 1/4W	1
R707		Carbon 120K ohm ±5% 1/4W	1
R807		Carbon 120K ohm ±5% 1/4W	1
R918		Carbon 1.5K ohm ±5% 1/4W	1
R701,801		Carbon 33K ohm ±5% 1/4W	2
R501,551		Carbon 1M ohm ±5% 1/4W	2
R503,553		Carbon 1M ohm ±5% 1/4W	2
R552		Carbon 33K ohm ±5% 1/4W	1
R502		Carbon 33K ohm ±5% 1/4W	1
R504,554		Carbon 180 ohm ±5% 1/4W	2
R505		Carbon 3.3K ohm ±5% 1/4W	1
R555		Carbon 3.3K ohm ±5% 1/4W	1
R507		Carbon 47K ohm ±5% 1/4W	1
R557		Carbon 47K ohm ±5% 1/4W	1

PARTS LIST

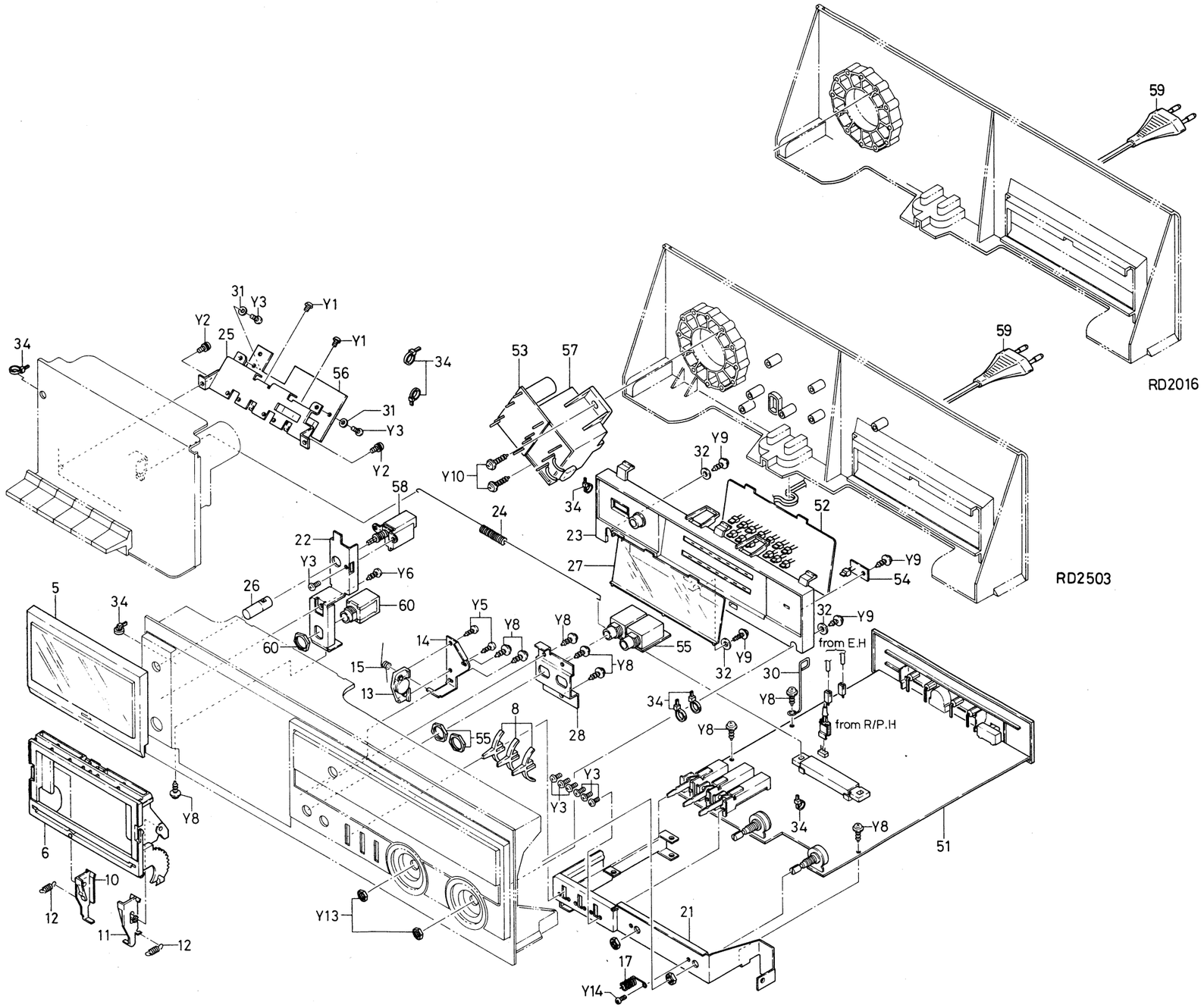
Ref No.	Part No.	Description	Q'ty
MAIN PCB ASS'Y			
R509,510		Carbon 270K ohm ±5% 1/4W	2
R559,560		Carbon 270K ohm ±5% 1/4W	2
R917		Carbon 100 ohm ±5% 1/4W	1
R717,817		Carbon 680K ohm ±5% 1/4W	2
R741,841, 720,820		Carbon 2.2K ohm ±5% 1/4W	4
R718,818		Carbon 1.2K ohm ±5% 1/4W	2
R719,819		Carbon 1K ohm ±5% 1/4W	2
R742,842		Carbon 100K ohm ±5% 1/4W	2
R721,821		Carbon 56K ohm ±5% 1/4W	2
R740,840		Carbon 1K ohm ±5% 1/4W	2
R724,824		Carbon 150 ohm ±5% 1/4W	2
R723,823		Carbon 10K ohm ±5% 1/4W	2
R725,825		Carbon 3.3K ohm ±5% 1/4W	2
R726,826		Carbon 2.2K ohm ±5% 1/4W	2
R727,827		Carbon 4.7K ohm ±5% 1/4W	2
R839		Carbon 2.2K ohm ±5% 1/4W	1
R728,828, 739		Carbon 2.2K ohm ±5% 1/4W	3
R729,829		Carbon 15K ohm ±5% 1/4W	2
R730,830		Carbon 150K ohm ±5% 1/4W	2
R731,831		Carbon 1.8K ohm ±5% 1/4W	2
R732,832		Carbon 22K ohm ±5% 1/4W	2
R733,734, 735,833, 834,835		Carbon 1M ohm ±5% 1/4W	6
R737,837		Carbon 1M ohm ±5% 1/4W	2
R836,736		Carbon 1M ohm ±5% 1/4W	2
R711		Carbon 5.6K ohm ±5% 1/4W	1
R738		Carbon 1.2K ohm ±5% 1/4W	1
R838		Carbon 1.2K ohm ±5% 1/4W	1
R751,851		Carbon 47K ohm ±5% 1/4W	2
R752,852		Carbon 10K ohm ±5% 1/4W	2
R753,853		Carbon 18K ohm ±5% 1/4W	2
R558		Carbon 560K ohm ±5% 1/4W	1
R901		Carbon 3.3K ohm ±5% 1/4W	1
R905		Carbon 100 ohm ±5% 1/4W	1
R921		Carbon 4.7K ohm ±5% 1/4W	1
R916		Carbon 47 ohm ±5% 1/4W	1
R904		Carbon 27K ohm ±5% 1/4W	1
R906		Carbon 390K ohm ±5% 1/4W	1
R908		Carbon 820K ohm ±5% 1/4W	1
R909		Carbon 15K ohm ±5% 1/4W	1
R910		Carbon 120K ohm ±5% 1/4W	1
R610		Carbon 10 ohm ±5% 1/4W	1
R710,810, 811		Carbon 5.6K ohm ±5% 1/4W	3
R604		Carbon 47K ohm ±5% 1/4W	1
R605		Carbon 18 ohm ±5% 1/4W	1
R914		Carbon 33K ohm ±5% 1/4W	1
R915		Carbon 33K ohm ±5% 1/4W	1
R912,913		Carbon 4.7K ohm ±5% 1/4W	2
R903		Carbon 150K ohm ±5% 1/4W	1
R508		Carbon 560K ohm ±5% 1/4W	1
	CAPACITORS		
C903		Electrolytic 220μF 25V	1
C904		Electrolytic 2.2μF 25V	1
C905		Electrolytic 10μF 25V	1
C909		Electrolytic 47μF 16V	1
C602,703, 803		Electrolytic 10μF 16V	3
C907		Electrolytic 470μF 25V	1
C911		Electrolytic 100μF 35V	1
C908,906		Electrolytic 100μF 16V	2
C705,805		Electrolytic 100μF 6.3V	2
C706,806, 508,510, 558,560		Electrolytic 4.7μF 25V	6
C501,551, 503,553, 740,840		Electrolytic 2.2μF 25V	6
C515,513, 517,565, 563,567		Electrolytic 10μF 16V	6
C520,570		Electrolytic 220μF 16V	2
C711,722, 723,811, 822,823		Electrolytic 2.2μF 25V	6
C724,824		Electrolytic 22μF 16V	2

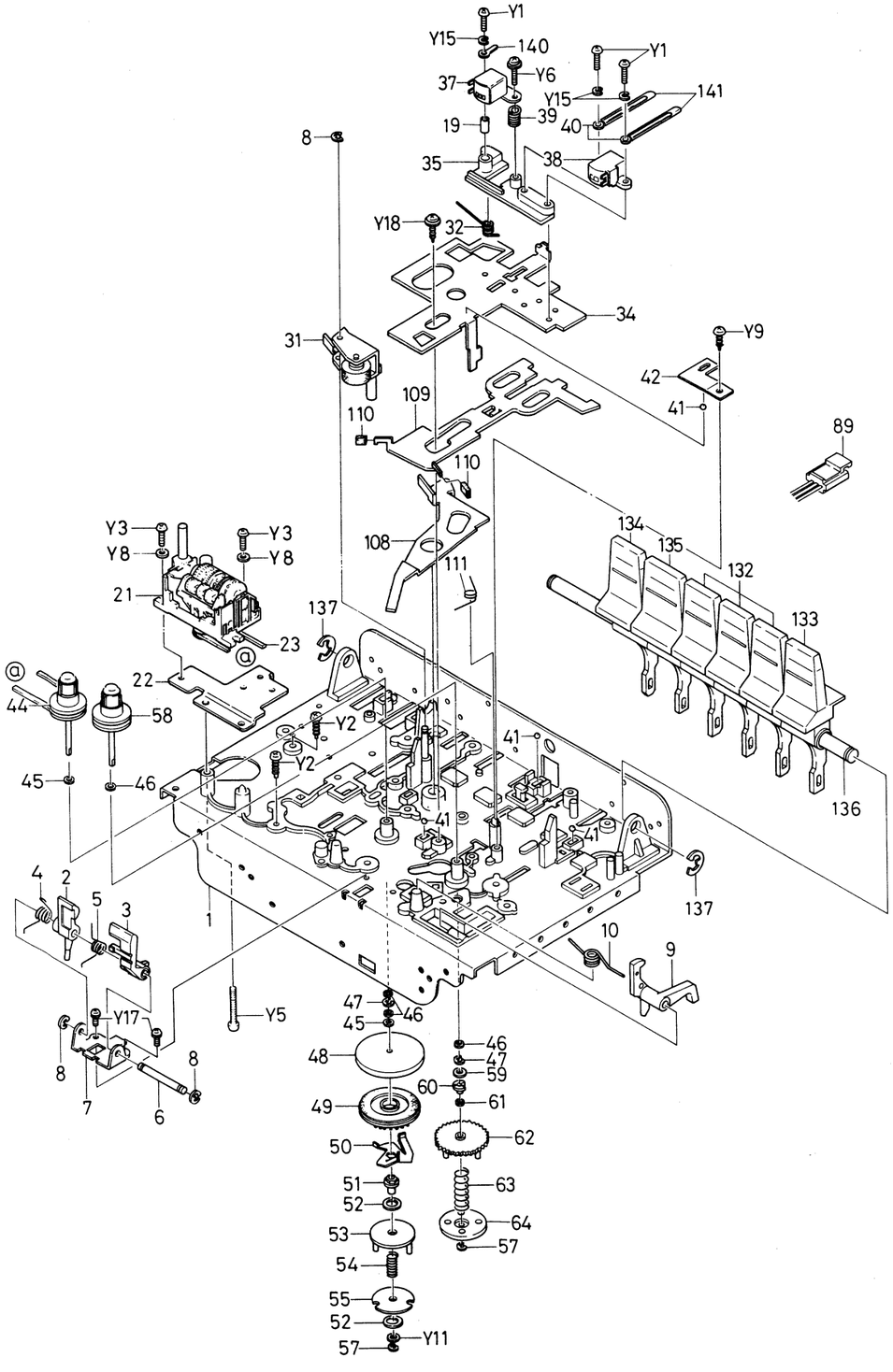
Ref. No.	Part No.	Description	Q'ty
MAIN PCB ASS'Y			
C734,834		Electrolytic 1μF 25V	2
C750,850		Electrolytic 4.7μF 25V	2
C601		Electrolytic 47μF 25V	1
C518,568		AL Electrolytic 0.1μF 16V +40–20%	2
C519,569		AL Electrolytic 0.33μF 16V +40–20%	2
C725,825		AL Electrolytic 1μF 16V +40–20%	2
C607		Mylar 0.0015μF 50V ±5%	1
C509,559		Ceramic 100pF 50V ±10%	2
C708,808		Ceramic 220pF 50V ±10%	2
C701,801		Ceramic 560pF 50V ±10%	2
C702,802		Ceramic 330pF 50V ±10%	2
C704,804		Ceramic 0.001μF 50V ±10%	2
C741,841, 502,552		Ceramic 220pF 50V ±10%	4
C733,833		Ceramic 470pF 50V ±10%	2
C707,807		BC Con 0.022μF 25V ±5%	2
C511,561		BC Con 0.0056μF 25V ±5%	2
C512,562		BC Con 0.0047μF 25V ±5%	2
C514,564		BC Con 0.027μF 25V ±5%	2
C516,566		BC Con 0.047μF 25V ±5%	2
C726,826		BC Con 0.022μF 25V ±5%	2
C727,827		BC Con 0.018μF 25V ±5%	2
C730,830		BC Con 0.012μF 25V ±10%	2
C729,829		BC Con 0.039μF 25V ±10%	2
C731,831		BC Con 0.0082μF 25V ±10%	2
C732,832		BC Con 0.018μF 25V ±5%	2
C606		BC Con 0.01μF 25V ±10%	1
C604,605		BC Con 0.0015μF 25V ±10%	2
C603		BC Con 0.047μF 25V ±20%	1
C709,809		BC Con 0.0022μF 25V ±5%	2
C608		Ceramic, 120pF 50V ±10%	1
C609		Ceramic, 220pF 50V ±10%	1
LEVEL DISPLAY PCB ASS'Y			
52	141-4-233T-11671	P.C Board Ass'y, Level Display	1
IC751		IC LB1416	2
D757,758, 857,858		LED SLP151B Red	4
D752,753, 754,755, 756,852, 853,854, 855,856		LED SLP251B A Green	10
Q751,851		Transistor 2SC536 or 2SC2320	2
D751,851		Diode DS442 X	2
C751,752, 851,852		Electrolytic Cap. 10μF 16V	4
	RESISTORS		
R867		Carbon 820 ohm ±5% 1/4W	1
R762,763, 764,765		Carbon 33 ohm ±5% 1/4W	4
R862,863, 864,865		Carbon 33 ohm ±5% 1/4W	4
R761,861		Carbon 150 ohm ±5% 1/4W	2
R766,866		Carbon 2.7K ohm ±5% 1/4W	2
R754,854		Carbon 3.3K ohm ±5% 1/4W	2
R755,758, 759,855, 858,859		Carbon 10K ohm ±5% 1/4W	6
R760,756, 860,856		Carbon 33K ohm ±5% 1/4W	4
R757,857		Carbon 100K ohm ±5% 1/4W	2
POWER SUPPLY PCB ASS'Y			
53	141-4-230T-93910	P.C Board Ass'y, Power Supply	1
D901,902, 903,904		Diode 1N4003 or SR1K2	4
C902		Electrolytic Cap. 470μF 35V	1
C901		Electrolytic Cap. 2200μF 16V	1

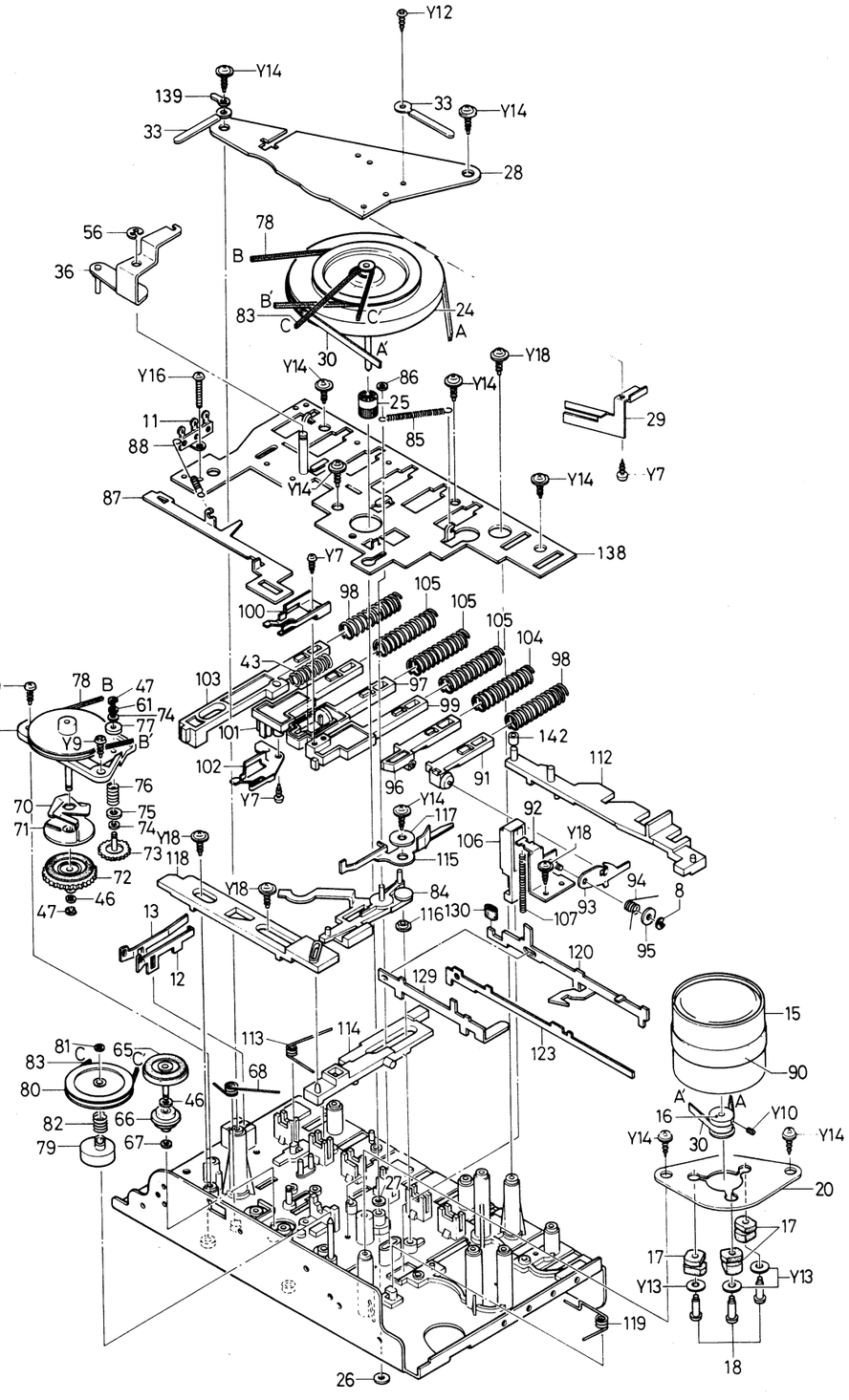
PARTS LIST

Ref. No.	Part No.	Description	Q'ty
REC DISPLAY PCB ASS'Y			
54	141-4-233T-46700	P.C Board Ass'y, Rec Display	1
D905		LED SLP151B Red	1
MIC SOCKET PCB ASS'Y			
55	141-4-233T-48271	P.C Board Ass'y, Mic Socket	1
	4-235T-68872	Socket, Mic Right	1
	4-235T-68800	Socket, Mic Left/Mono	1
R702,802		Carbon 4.7K ohm ±5% 1/4W	2
MUTE SWITCH PCB ASS'Y			
56	141-4-233T-26501	P.C Board Ass'y, Mute Switch	1
S5,6	4-231T-51372	Switch, Stop, Play	2

EXPLODED VIEW (CHASSIS)




Y1
Y15
140
37
Y6
Y1
Y15
141
19
39
40
8
35
38
Y18
32
34
31
Y9
42
41
109
110
89
110
108
111
134
135
132
133
Y3
Y8
Y3
Y8
21
137
23
22
44
58
Y2
Y2
41
45
46
41
41
136
137
4
2
5
3
1
10
9
Y5
47
45
46
Y17
48
46
47
59
60
61
49
62
8
8
7
6
50
63
51
52
64
53
57
54
55
52
Y11
57


Y12
Y14
139
33
33
Y14
28
56
78
36
B
B'
83
C
C'
24
A
A'
30
Y14
86
Y18
Y14
Y16
25
29
11
85
88
Y14
Y14
Y7
87
138
Y7
98
105
105
105
104
100
43
98
Y9
78
B
47
61
74
103
97
69
77
99
Y9
B'
101
142
102
112
76
Y7
96
Y14
91
70
75
92
117
71
74
Y18
106
Y18
118
73
115
72
Y18
84
94
47
46
116
130
107
93
8
13
95
120
129
15
12
123
90
113
114
81
65
C
C
83
68
80
46
A'
A
16
Y10
82
66
Y14
30
Y14
79
67
20
27
17
17
Y13
Y13
119
26
18

PARTS LIST

Ref. No.	Part No.	Description	Q'ty
MECHANISM			
1	141-0-311T-31121	Chassis Ass'y	1
2	141-2-742T-25800	Lever	1
3	141-2-742T-18300	Lever	1
4	141-2-852T-47300	Spring Wire	1
5	141-2-852T-48400	Spring Wire	1
6	141-2-753T-41400	Shaft	1
7	141-2-747T-16400	Bracket Lever	1
8	141-2-457T-23000	Special Washer, E Ring 2mm	4
9	141-2-742T-14500	Lever	1
10	141-2-852T-47200	Spring Wire	1
11	4-237T-05800	Terminal Board	1
12	141-2-853T-48601	Spring Plate	1
13	141-2-853T-48500	Spring Plate	1
15	4-527T-15100	Motor	1
16	141-2-661T-75500	Pulley, Motor	1
17	141-2-445T-11801	Rubber Cushion	3
18	141-2-421T-12501	Special Screw	3
19	141-2-462T-55800	Boss	1
20	141-2-378T-09800	Bracket, Motor	1
21	141-2-811T-07200	Counter	1
22	141-2-812T-08300	Bracket, Counter	1
23	141-2-564T-20700	Square Belt, Counter	1
24	141-0-521T-09700	Flywheel Ass'y	1
25	141-2-581T-15400	Gear	1
26	141-2-457T-04300	Special Washer	1
27	141-2-453T-30200 141-2-453T-30201 141-2-453T-30202	Washer 2.6×4.7×0.13 Nylon Washer 2.6×4.7×0.25 Nylon Washer 2.6×4.7×0.5 Nylon	1 (or)
28	141-0-524T-07903	Bracket Flywheel Ass'y	1
29	141-2-351T-46300	Bracket Mounting	1
30	141-2-561T-04501	Flat Belt	1
31	141-0-545T-05800	Lever Pinch Roller Ass'y	1
32	141-2-852T-47400	Spring Wire	1
33	141-2-472T-01001	Lug	2
34	141-2-731T-69301	Slide	1
35	141-2-464T-32000	Fixer	1
36	141-0-742T-31200	Lever Ass'y	1
37	4-242T-25700	R/P Head	1
38	4-242T-24700	E Head	1
39	141-2-851T-82700	Spring Coil	1
40	141-2-472T-05900	Lug	2
41	141-2-345T-00400	Steel Ball	4
42	141-2-853T-54900	Spring Plate	1
43	141-2-855T-11800	Spring Coil	1
44	141-0-531T-12200	Reel Plate Ass'y	1
45	141-2-453T-30100	Washer 2.1×4×0.13 Nylon	1
46	141-2-453T-30101	Washer 2.1×4×0.25 Nylon	7
47	141-2-457T-23800	Special Washer	4
48	141-2-547T-02100	Roller	1
49	141-0-581T-15000	Gear Ass'y	1
50	141-2-853T-54500	Spring Plate	1
51	141-2-457T-13300	Special Washer	1
52	141-2-453T-30500	Washer 4.1×6.5×0.13 Nylon	2
53	141-2-671T-05500	Cum	1
54	141-2-855T-23500	Spring Coil	1
55	141-2-457T-13000	Special Washer	1
56	141-2-457T-23100	Special Washer	1
57	141-2-457T-23700	Special Washer	2
58	141-0-531T-12201	Reel Plate Ass'y	1
59	141-2-457T-06200	Special Washer	1
60	141-2-661T-74000.	Pully	1
61	141-2-457T-10200	Special Washer	2
62	141-2-581T-10700.	Gear	1
63	141-2-855T-65500	Spring Coil	1
64	141-2-661T-26500.	Pulley	1
65	141-0-551T-01720	Idler Ass'y	1
66	141-2-661T-26600	Pulley	1
67	141-2-453T-31600	Washer 1.6×4×0.25	1
68	141-2-852T-47800.	Spring Wire	1
69	141-0-351T-48300	Bracket M.T.G Ass'y	1
70	141-2-853T-54401	Spring Plate	1
71	141-2-457T-13100	Special Washer	1
72	141-0-581T-10400	Gear Ass'y	1
73	141-0-581T-10500	Gear Ass'y	1
74	141-2-457T-11000	Special Washer	2
75	141-2-457T-14000	Special Washer	1
76	141-2-855T-23400	Spring Coil	1
77	141-2-457T-13600	Special Washer	1
78	141-2-564T-20600	Square Belt	1
79	141-2-671T-05600	Cum	1
80	141-2-661T-26400	Pulley	1

Ref. No.	Part No.	Description	Q'ty
MECHANISM			
81	141-2-453T-31600	Washer 1.6×4×0.25	1
82	141-2-855T-30300	Spring Coil	1
83	141-2-564T-18400	Squar Belt	1
84	141-0-742T-14101	Lever Ass'y	1
85	141-2-855T-23101	Spring Coil	1
86	141-2-457T-14300	Special Washer	1
87	141-2-742T-13900	Lever	1
88	141-2-855T-26300	Spring Coil	1
89	4-235T-60300	Socket	1
90	141-2-184T-02300	Tape 180mm	1
91	141-0-731T-71800	Sride Ass'y	1
92	141-0-747T-17200	Bracket Lever Ass'y	1
93	141-2-742T-13800	Lever	1
94	141-2-852T-47700	Spring Wire	1
95	141-2-453T-00800	Washer	1
96	141-2-731T-59100	Slide	1
97	141-2-731T-74200	Slide	1
98	141-2-855T-29500	Spring Coil	2
99	141-2-731T-68900	Slide	1
100	141-2-853T-61600	Spling Plate	1
101	141-2-731T-69100	Slide	1
102	141-2-853T-61700	Spling Plate	1
103	141-2-731T-69200	Slide	1
104	141-2-855T-23000	Spring Coil	1
105	141-2-855T-37200	Spring Coil	3
106	141-2-731T-64300	Slide	1
107	141-2-855T-30200	Spring Coil	1
108	141-2-742T-29700	Lever	1
109	141-2-731T-65600	Slide	1
110	141-2-712T-02700	Brake Shoe	2
111	141-2-852T-49000	Spring Wire	1
112	141-2-742T-26100	Lever	1
113	141-2-852T-55500	Spring Wire	1
114	141-2-731T-59200	Slide	1
115	141-2-853T-54601	Spring Plate	1
116	141-2-683T-34200	Ring	1
117	141-2-457T-33400	Special Washer	2
118	141-2-731T-59301	Slide	1
119	141-2-852T-47600	Spring Wire	1
120	141-2-731T-69700	Slide	1
123	141-2-731T-85600	Slide	1
129	141-0-731T-69602	Slide Ass'y	1
130	141-2-490T-08000	Tube 3mm	1
132	141-2-611T-12706	Lever Push Button, Play, Rew, F. FWD	3
133	141-2-611T-12705	Lever Push Button, Rec	1
134	141-2-611T-12803	Lever Push Button, Pause	1
135	141-2-611T-12902	Lever Push Button, Stop, Eject	1
136	141-2-753T-57600	Shaft	1
137	141-2-457T-20300	Special Washer	2
138	141-0-737T-06700	Bracket Slide Ass'y	1
139	123-2-472R-00400	Lug	2
140	123-2-472R-00200	Lug	1
141	141-2-490T-00600	Tube 40mm	1
142	141-2-490T-08301	Tube 5mm	1

SCREWS & OTHERS (MECHANISM)			
Y1		Pan Head Screw 2×11mm	3
Y2		Washer Head Tapping Screw 3×10mm	2
Y3		Tapping Screw 2.6×6mm	2
Y5		Pan Head Screw 3×16mm	1
Y6		Washer Head Tapping Screw 2×10mm	1
Y7		Tapping Screw 2.3×6mm	3
Y8		Washer 2.6mm	2
Y9		Binding Head Tapping Screw 3×6mm	3
Y10		Headless Screw 2×4mm	1

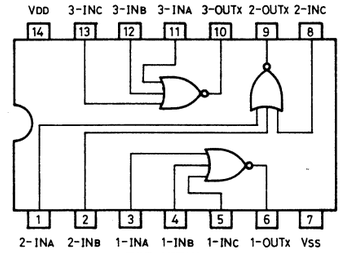
PARTS LIST

Ref. No.	Part No.	Description	Q'ty
SCREWS & OTHERS (MECHANISM)			
Y11		Washer 2×6×0.4mm	1
Y12		Tapping Screw 3×6mm	1
Y13		Washer 3×8×0.5mm	3
Y14		Washer Head Tapping Screw 3×8mm	6
Y15		Spring Washer 2mm	3
Y16		Pan Head Screw (Self Tapping Type) 3×18mm	1
Y17		Pan Head Screw with Spring Washer 2.6×4mm	2
Y18		Washer Head Tapping Screw 3×6mm	4

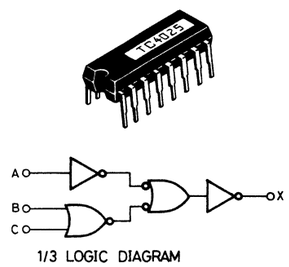
IC BLOCK DIAGRAM

TC4025 (TRIPLE 3-INPUT POSITIVE NOR GATE)

BLOCK DIAGRAM



(TOP VIEW)

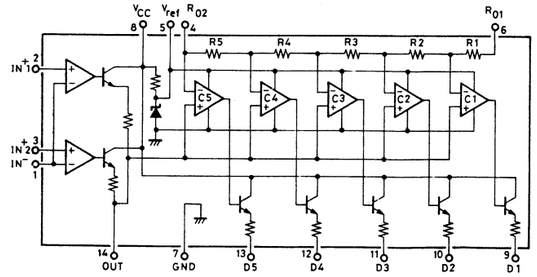


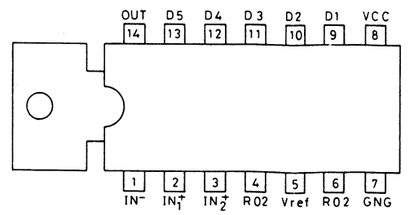
1/3 LOGIC DIAGRAM

TRUTH VALUE TABLE

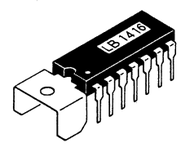
INPUT			OUTPUT
A	B	C	X
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	L

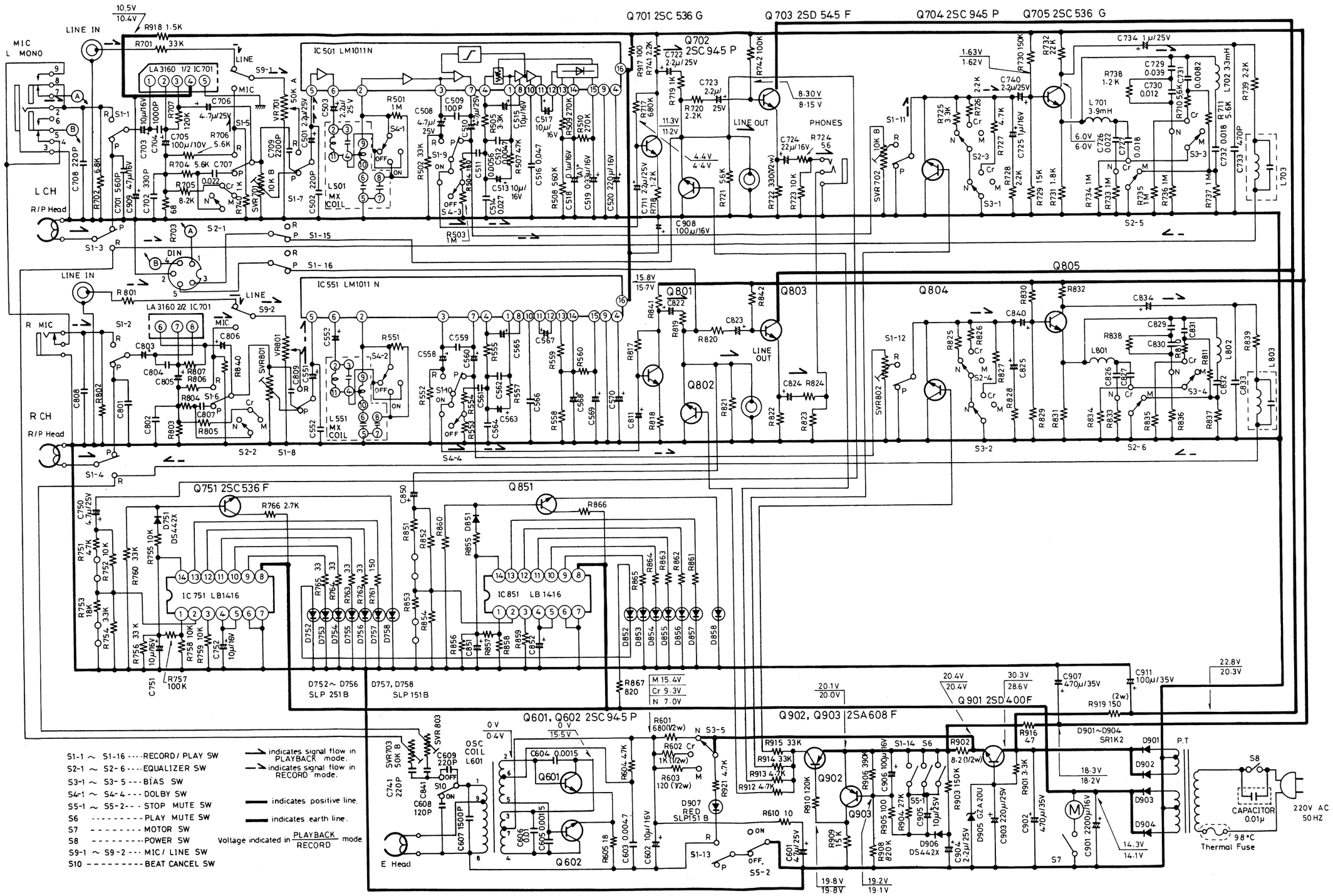
LB1416 (5 DIGITS LEVEL METER DRIVER)

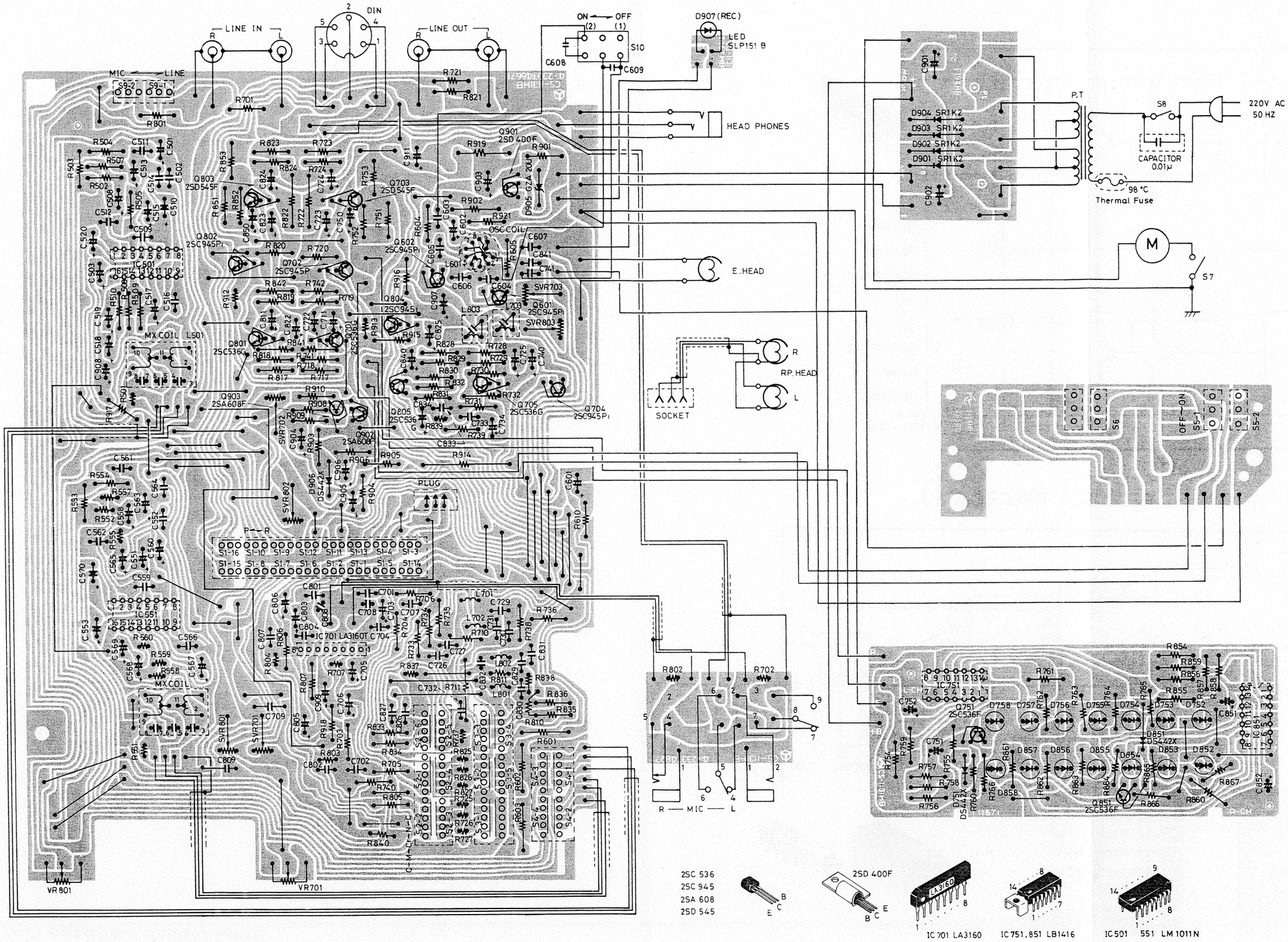




(TOP VIEW)




Q701 2SC 536 G
Q703 2SD 545 F
Q704 2SC 945 P
Q705 2SC 536 G
Q702 2SC 945 P
IC 501 LM1011N
LA 3160 1/2 IC701
IC 551 LM1011 N
LA 3160 2/2 IC701
Q801
Q803
Q804
Q805
Q802
Q751 2SC536 F
Q851
IC 751 LB1416
IC 851 LB 1416
Q601, Q602 2SC 945 P
Q902, Q903 2SA608 F
Q 901 2SD400F
L CH
R CH
R/P Head
E Head
MIC
LINE IN
LINE
LINE OUT
PHONES
DIN
L501 MX COIL
L551 MX COIL
OSC COIL L601
D752~ D756 SLP 251B
D757, D758 SLP 151B
D907 RED SLP151 B
D901~D904 SR1K2
CAPACITOR 0.01μ
Thermal Fuse
220V AC 50HZ
S1-1 ~ S1-16 ----RECORD/ PLAY SW
S2-1 ~ S2-6 ----EQUALIZER SW
S3-1 ~ S3-5 ---BIAS SW
S4-1 ~ S4-4 ---DOLBY SW
S5-1 ~ S5-2 ---STOP MUTE SW
S6 ----------PLAY MUTE SW
S7 ----------MOTOR SW
S8 ----------POWER SW
S9-1 ~ S9-2 ---MIC/ LINE SW
S10 ----------BEAT CANCEL SW
indicates signal flow in PLAYBACK mode.
indicates signal flow in RECORD mode.
indicates positive line.
indicates earth line.
Voltage indicated in PLAYBACK / RECORD mode



2SC 536
2SC 945
2SA 608
2SD 545

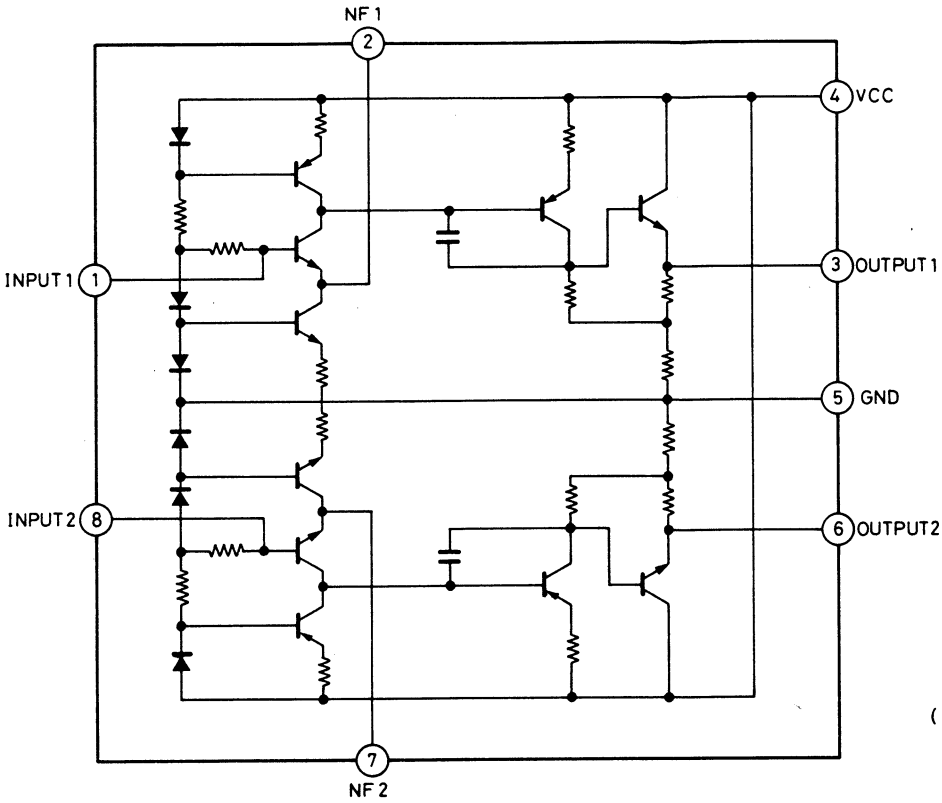
2SD 400F

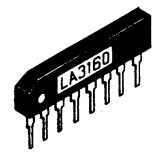
IC 701 LA3160

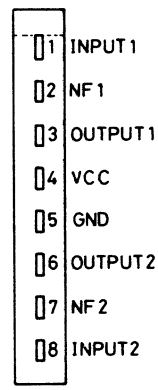
IC 751, 851 LB1416

IC 501 551 LM 1011N

LA3160 (2 CHANNEL PREAMPLIFIER)

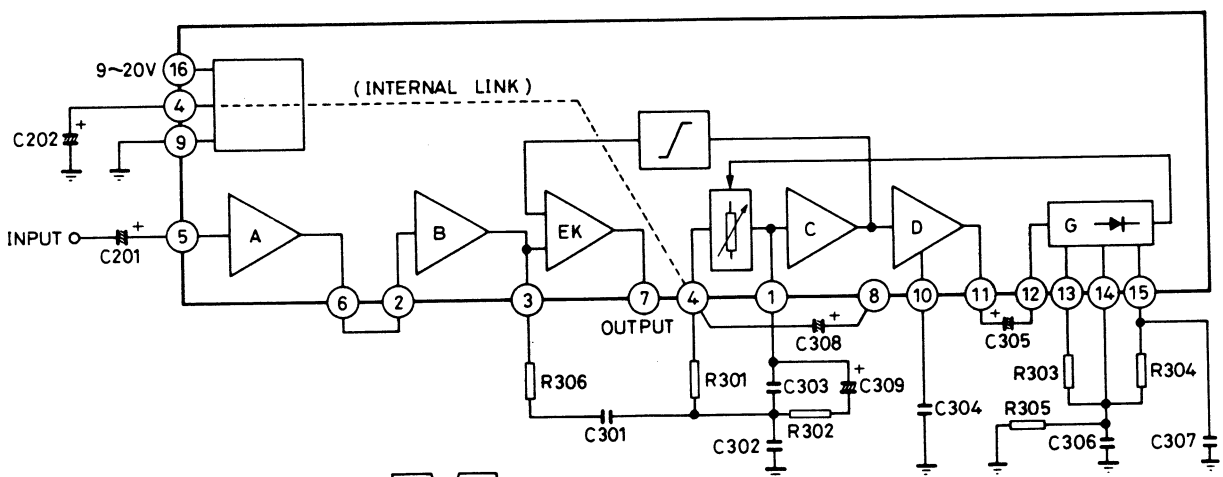


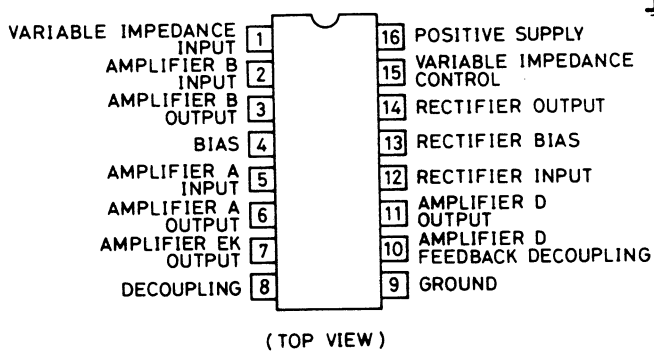




(BOTTOM VIEW)

LM1011 (DOLBY B-TYPE NOISE REDUCION PROCESSOR)





(TOP VIEW)